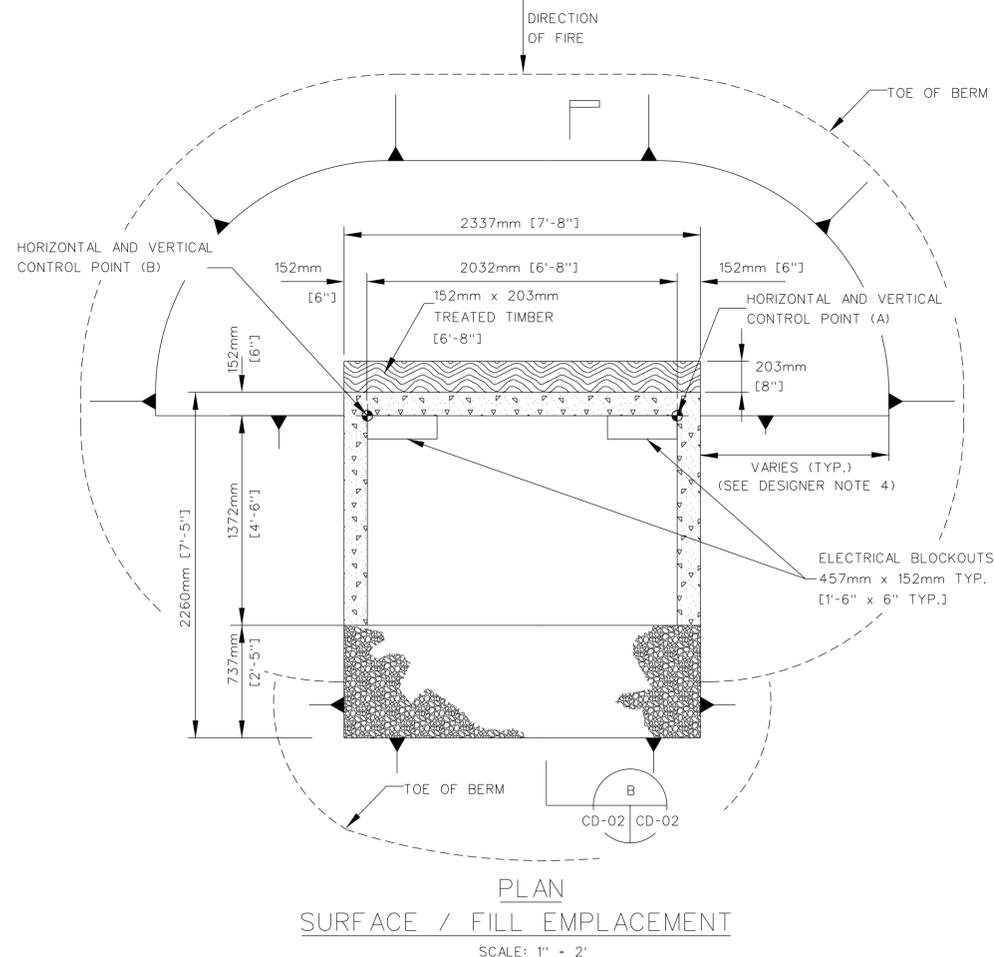
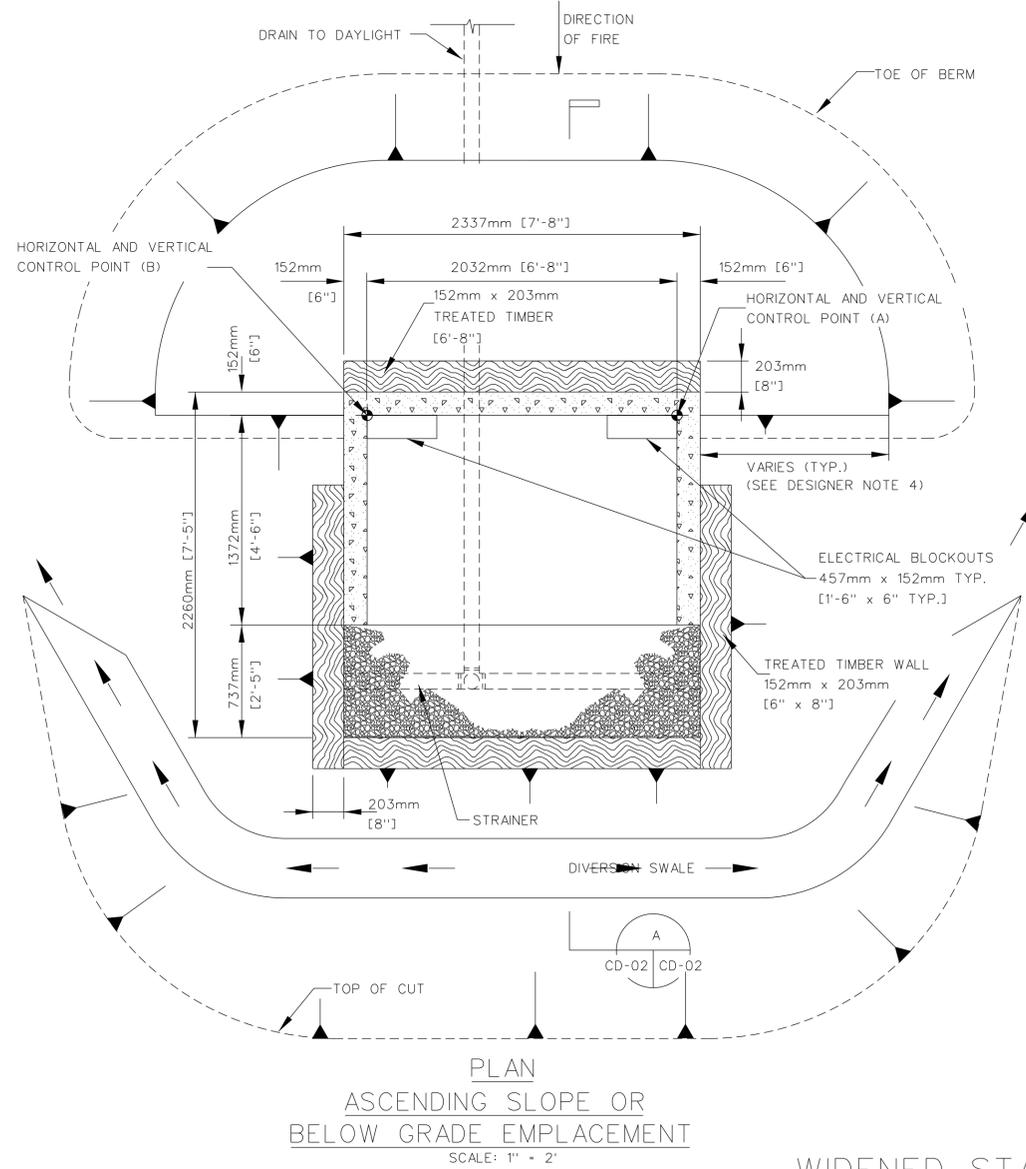
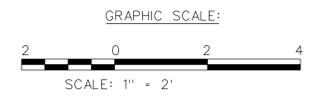


- GENERAL NOTES:**
- CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 28MPa (4000psi) IN 28 DAYS.
 - EMPLACEMENTS SHALL BE CONSTRUCTED OF REINFORCED CONCRETE; CONCRETE STRUCTURES SHALL BE PRECAST OR CAST-IN-PLACE.
 - ALL REINFORCING STEEL SHALL BE PER ASTM A615, GRADE 60.
 - AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED OR RESURFACED CONSISTENT WITH THE NATURAL SURROUNDINGS. GROUND COVER SHALL NOT REDUCE TARGET VISIBILITY.
 - PLACE RAILROAD TIES AGAINST CONCRETE WALL ON L102mm x 102MM x 12.7mm x 102mm [4"x4" x 1/2" x 4"] STEEL ANGLES SPACED A MAXIMUM OF 914mm [3'] ON CENTER. ATTACH ANGLE TO CONCRETE WITH CONCRETE ANCHORS.
 - ALL DIMENSIONS ARE INDICATED AS FOLLOWS: METRIC UNITS [ENGLISH] FOR INSTANCE, 1372mm [4'-6"]
 - HORIZONTAL CONTROL POINT (A) IS LOCATED ON THE LEFT SIDE OF TARGET AS VIEWED FROM THE FIRING POSITION.
 - PROVIDE 13mm [1/2"] CHAMFER ON ALL EXPOSED CONCRETE SURFACES.
 - LABEL EACH EMPLACEMENT. COORDINATE WITH RANGE CONTROL FOR NUMBERING SCHEME.

NOTE ALSO APPLIES TO SIT WITH HOSTILE FIRE SIMULATOR



- NOTES TO DESIGNER:**
- MINIMUM FRONT WALL HEIGHT IS 457mm [18"]. THE FRONT WALL MUST BE HIGH ENOUGH TO PROTECT THE TARGETRY EQUIPMENT WHILE STILL ALLOWING A MINIMUM OF 90% OF THE TARGET TO BE VISIBLE FROM THE FIRING POSITION. THE MINIMUM WALL HEIGHT OF 457mm [18"] PROVIDES TARGET EQUIPMENT PROTECTION UP TO A 10° ANGLE OF FIRE. (THE TARGET ARMS AND CLAMP ARE NOT PROTECTED ABOVE 10°.) IT ALSO ALLOWS 90% VISIBILITY DOWN TO A -2° ANGLE OF FIRE. A GEOMETRIC ANALYSIS WILL BE REQUIRED FOR ANGLES OF FIRE GREATER THAN 10° OR LESS THAN -2°. EXCESSIVE ANGLES OF FIRE MAY REQUIRE INCREASING THE HEIGHT OF THE FRONT WALL OR INSTALLING THE EMPLACEMENT OFF-LEVEL AT AN ANGLE THAT MATCHES THE ANGLE OF FIRE. ANGLES OF FIRE LESS THAN -2° MAY REQUIRE RAISING THE TARGET LIFTER, INSTALLING LONGER TARGET ARMS OR INSTALLING THE EMPLACEMENT OFF-LEVEL AT AN ANGLE THAT MATCHES THE ANGLE OF FIRE. THE DESIGNER MUST DEMONSTRATE DURING THE COURSE OF DESIGN THAT THE TARGETS ARE VISIBLE AND THAT THE ENTIRE CONCRETE EMPLACEMENT IS PROTECTED FROM DIRECT FIRE. ON RANGES WHERE TARGETS ARE ENGAGED FROM MULTIPLE POINTS, THE DESIGNER MUST COORDINATE CLOSELY WITH THE INSTALLATION AND THE TARGETRY PROVIDER TO DETERMINE THE CORRECT FRONT WALL HEIGHT.
 - RETAINING WALLS SHALL BE CONSTRUCTED OF ADEQUATELY CONNECTED TIMBERS OR RAILROAD TIES (MAY BE PREFABRICATED). FILTER FABRIC SHALL BE INSTALLED BEHIND ALL WOOD RETAINING WALLS. FILTER FABRIC SHALL EXTEND THE FULL HEIGHT OF THE WALL.
 - THE DESIGNER HAS THE OPTION TO USE THE BELOW GRADE EMPLACEMENT DESIGN TO PROVIDE MORE REALISTIC TRAINING. IF THE SITE CONDITIONS ARE NOT ADEQUATE TO SUPPORT POSITIVE DRAINAGE OF THE TARGET EMPLACEMENT, THE TOP OF THE SUBGRADE SHOULD HAVE A MINIMUM LONGITUDINAL SLOPE OF 2% TOWARD THE FRONT OF THE EMPLACEMENT.
 - REFER TO THE BERM THICKNESS FIGURES LOCATED IN THE DESIGN MANUAL TO DETERMINE REQUIRED BERM THICKNESS.
 - BERM SLOPES SHOWN AS 3:1 ARE TYPICAL. DIFFERENT SLOPES MAY BE REQUIRED BY THE SITE SPECIFIC GEOTECHNICAL REPORT.
 - WHERE EMPLACEMENT IS SITED IN FRONT OF AN ARMOR TARGET, USE LARGER PROJECTILE TO DESIGN EMBANKMENT.



Rev.	Date	Description

Designed by:	Checked by:	Reviewed by:	Submitted by:
U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE HUNTSVILLE, ALABAMA			
Date:	Design file no.:	Drawing code:	File name / Plot scale:
FEBRUARY 2010			

RANGE AND TRAINING LAND PROGRAM
STANDARD DESIGN MANUAL
WIDENED STATIONARY INFANTRY
TARGET EMPLACEMENT